

REMARKS

Claims 1, 5, 6, 13 and 15-17 are amended. Claims 1-25 and 44-59 remain in the application.

The Examiner requests a new title that is descriptive. The same request was made in the previous office action, paper 8, wherein Applicant responded and amended as requested in the Response mailed March 6, 2003. Accordingly, this request is moot.

Claims 50-59 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Patent No. 6,207,523. A Terminal Disclaimer is provided to overcome the obviousness-type double patenting rejection against claims 50-59. Accordingly, this rejection is rendered moot.

Claims 1 and 2 stand rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. Specifically, the Examiner states that “only two” is not enabled by the specification. The Examiner is presumably referring to the claim 1 recitation to: “forming a solid mass of silicon material within an opening formed over a doped region of a silicon substrate, the mass comprising only two forms of silicon”. However, the originally-filed application illustrates and describes such recited limitation of claim 1, and therefore, the limitation is enabled.

In the context of enablement, all that is necessary is that one skilled in the art be able to practice the claimed invention, given the level of knowledge

and skill in the art. MPEP §2164.08 (8th Ed.). Further, the scope of enablement must only bear a “reasonable correlation” to the scope of the claims. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970); MPEP §2164.08 (8th Ed.). An exemplary embodiment of Applicant’s invention is illustrated at Fig. 6 and discloses openings 38a, 39a and 40a formed in an insulative layer 34a (see pg. 7 of the originally-filed application for description). Fig. 7 illustrates an undoped silicon layer 100 formed within and partially filling openings 38a, 39a and 40a, and a doped silicon layer 102 formed over undoped silicon layer 100 within openings 38a, 39a and 40a and filling the openings (see pg. 8 of the originally-filed application for description). That is, **only two forms of silicon**, (layers 100 and 102) are illustrated and described to be formed within the openings (38a, 39a and 40a). Therefore, the disclosure clearly enables one skilled in the art to practice forming a solid mass of silicon material within an opening formed over a doped region of a silicon substrate, the mass comprising only two forms of silicon as positively recited in claim 1. Consequently, the §112, first paragraph, rejection against claims 1 and 2 is inappropriate and should be withdrawn.

Claims 1, 2, 4 and 5 stand rejected under 35 U.S.C. §102 as being anticipated by Figura (5,963,804). Claims 11, 12, 24, 25 & 46-49 stand rejected under 35 U.S.C. §102(e) as being anticipated by Jost (5,686,747). Claims 50-57 stand rejected under 35 U.S.C. §102(e) as being anticipated by Wu et al. (5,913,129). Claim 3 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Figura et al. Claims 6-10 stand rejected under 35 U.S.C.

§103(a) as being unpatentable over Figura et al. in view of Brown (5,418,180). Claims 13-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dennison et al. (5,340,765). Claims 58 and 59 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wu et al. in view of Kim et al. (5,324,679).

Please note, no rejection is presented against claims 44-45, and therefore, Applicant respectfully requests allowance of claims 44-45 in the next office action. If the Examiner decides to present a rejection against either claim in the next office action, Applicant respectfully requests that the office action be presented as a non-final action to provide the Applicant an opportunity to respond to the rejection which is clearly his right to do so.

Regarding the anticipation rejection against independent claim 1 based on Figura, such claim recites forming a solid mass of silicon material within an opening formed over a doped region of a silicon substrate, the mass comprising only two forms of silicon, the mass including undoped silicon in **physical contact** with the doped region. Figura teaches a polysilicon layer 20 and a HSG or CSG polysilicon material 20b formed within a recess 18 (col. 6, lines 8-40; Figs. 2-4). However, neither polysilicon layer 20 or polysilicon material 20b are formed in physical contact with a doped region. Accordingly, in no fair or reasonable interpretation does Figura teach or suggest forming a solid mass of silicon material within an opening and comprising only two forms of silicon, the mass including undoped silicon in physical contact with the doped region as recited in claim 1. Since Figura fails to teach or suggest a positively recited limitation of claim 1, claim 1 is allowable.

Claims 2-4 and 44 depend from independent claim 1, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

In addition, claim 3 stands rejected as being obvious over Figura. Figura is an inappropriate reference for an obviousness rejection against claims in the present application under Section 35 U.S.C. §103(c). Figura, U.S. Patent No. 5,963,804, and the above-referenced application, are commonly owned. MPEP §706.02(I)(3) states that such commonly owned reference is disqualified when:

- (a) proper evidence is filed [referring to the statement of common ownership];
- (b) the reference qualifies under 35 U.S.C. §102(e) for applications filed on or after November 29, 1999; and
- (c) the reference is used in an obviousness rejection under 35 U.S.C. §103(a).

Common ownership of the present application and Figura is demonstrated by: a) the front page of the patent to Figura lists the assignee as Micron Technology, Inc.; and, b) the present application is assigned to Micron Technology, Inc., as evidenced by the assignment recorded on 7/3/97, at reel 8663, frames 0400-0404. The Figura reference qualifies as a §102(e) reference (priority date of present application is 7/3/97 and priority date for Figura is 3/14/97 and issued date is 10/5/99) and is used in an obviousness rejection. Moreover, the above-referenced application was filed after the November 29, 1999 deadline. Accordingly, the requirements of MPEP §706.02(I)(3), and therefore §103(c), are met. Consequently, the obviousness rejection against

claim 3 based on Figura is inappropriate and should be withdrawn. Applicant respectfully requests withdrawal of such rejection in the next office action. Since no other rejections are presented against claim 3, claim 3 is allowable.

Regarding the anticipation rejection against independent claim 5 based on Figura, such claim is amended to recite forming a solid mass of silicon material comprising a **solid core of doped silicon** substantially **surrounded** by undoped silicon leaving exposed doped silicon and exposed undoped silicon, and the mass further comprising a portion of the undoped silicon in **contact** with the doped diffusion region. The amendment language is supported by an exemplary embodiment of Applicant's invention at, for example, Figs. 8-10 of the originally-filed application. Figura fails to teach or suggest a solid core of doped silicon substantially surrounded by undoped silicon **and** a portion of the undoped silicon in contact with the doped diffusion region as positively recited in claim 5. Accordingly, since Figura fails to teach or suggest positively recited limitations of claim 5, claim 5 is allowable.

Claims 6-10 and 45 depend from independent claim 5, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Moreover, claims 5-10 stand rejected over the combination of Figura and Brown. As demonstrated previously, Figura is an improper obviousness reference

against the present application, and therefore, this rejection is inappropriate and should be withdrawn.

Regarding the anticipation rejection against independent claim 11 based on Jost, such claim recites forming two forms of silicon within **and filling** the opening. Jost teaches forming an HSG polysilicon layer 36 by first depositing a doped polysilicon layer followed by depositing an undoped HSG polysilicon (col. 4, Ins. 42-46; Figs. 3-6). However, as positively stated by Jost, polysilicon "layer 36 is deposited to a thickness which less than completely fills first contact opening 32 and second contact opening 34, thereby leaving outwardly open first voids 35 within the first and second contact openings" (col. 4, Ins. 34-39; Figs. 3-6). Accordingly, in no fair or reasonable interpretation does Jost teach or suggest forming two forms of silicon within **and filling** the opening as recited in claim 11. Since Jost fails to teach or suggest a positively recited limitation of claim 11, claim 11 is allowable.

Moreover, claim 11 further recites exposing the two forms of silicon to **common subsequent processing conditions** which substantially selectively form rugged polysilicon from one of the exposed two forms of silicon and not from another of the exposed two forms of silicon. Jost teaches forming first a doped polysilicon layer followed by depositing an undoped HSG polysilicon (col. 4, Ins. 42-46). That is, the undoped HSG polysilicon is formed **after** depositing the doped polysilicon layer, and therefore, the two silicon layers are not formed in a common subsequent processing condition. Consequently, Jost fails to teach

or suggest exposing the two forms of silicon to common subsequent processing conditions which substantially selectively form rugged polysilicon as recited in claim 11. Jost fails to teach or suggest another positively recited limitation of claim 11, and therefore, for this additional reason, claim 11 is allowable.

Claims 12 and 46 depend from independent claim 11, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Regarding the obviousness rejection against independent claim 13 based on Dennison, such claim is amended to recite an exposed outer sidewall surface comprising an only portion of the storage node which comprises HSG. The amendment language is supported by an exemplary embodiment of Applicant's invention at, for example, Fig. 10 of the originally-filed application. Dennison teaches forming HSG from exposed outer **and inner** sidewall surfaces, but not only the exposed outer sidewall surface (Figs. 7A-8). Accordingly, in no fair or reasonable interpretation does Dennison teach or suggest an exposed outer sidewall surface comprising an only portion of the storage node which comprises HSG as recited in claim 13. Since Dennison fails to teach or suggest a positively recited limitation of claim 13, such claim is allowable.

Claims 14-16 and 47 depend from independent claim 13, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Regarding the obviousness rejection against independent claim 17 based on Dennison, such claim is amended to recite forming an opening through only the insulative layer to the **doped region**. The amendment language is supported by an exemplary embodiment of Applicant's invention at, for example, Fig. 6 of the originally-filed application. Dennison teaches forming an opening through at least two insulative layers (oxide 14 and oxide layer 16) to a diffusion area 11 (Figs. 2A-2B; col. 3, Ins. 1-10). Accordingly, in no fair or reasonable interpretation does Dennison teach or suggest forming an opening through only the insulative layer to the doped region as recited in claim 17. Since Dennison fails to teach or suggest a positively recited limitation of claim 17, such claim is allowable.

Claims 18-23 and 48 depend from independent claim 17, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Regarding the anticipation rejection against independent claim 24 based on Jost, such claim recites a first undoped silicon layer, a second undoped silicon layer and a doped silicon layer together defining a capacitor storage node. Jost teaches two polysilicon layers forming a storage node (col. 4, Ins. 40-50). Accordingly, in no fair or reasonable interpretation does Jost teach or suggest the first undoped silicon layer, second undoped silicon layer and doped silicon layer together defining a capacitor storage node as recited in claim 24. Since

Jost fails to teach or suggest a positively recited limitation of claim 24, such claim is allowable.

Moreover, claim 24 further recites removing a portion of insulative layer to expose a sidewall surface of the storage node comprising the first undoped silicon layer. Jost fails to teach or suggest this limitation. Accordingly, in no fair or reasonable interpretation does Jost teach or suggest removing a portion of insulative layer to expose a sidewall surface of the storage node as recited in claim 24. Since Jost fails to teach or suggest another positively recited limitation of claim 24, and therefore, such claim is allowable for this additional reason.

Claims 25 and 49 depend from independent claim 24, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

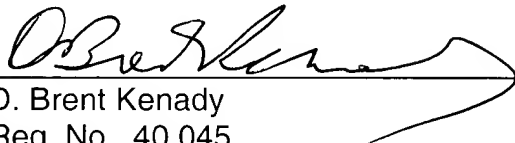
Regarding the anticipation rejection against claims 50-57 based on Wu, and the obviousness rejection against claims 58-59 based on Wu and Kim, Wu is an inappropriate reference against the present application. The priority date of the present invention is 7/3/97, and the U.S. filing date of Wu is 1/12/98. Accordingly, Wu is not a proper reference to the present invention, and therefore, the rejections based on the reference should be withdrawn. Since no other rejections are present against claims 50-59, such claims are allowable.

This application is now believed to be in immediate condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the

undersigned respectfully requests a telephone interview prior to issuance of any such subsequent action.

Respectfully submitted,

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